



E-13, UPSIDC, Site-IV, Kasna Road, Greater Noida, National Capital Region - 201308, India

Email: info@khuranaandkhurana.com | Website: www.khuranaandkhurana.com | Phone: +91 120 4296878

IOffices: (India) New Delhi . Greater Noida Noida (NCR) . Pune . Mumbai . Bangalore . Indore . Hyderabad .
Jalandhar . Chennai

(Overseas) US . Myanmar . Vietnam . Bangladesh . Nepal . Malaysia . Sri Lanka . India

Patentability Search Report

On

“Software Product For Suggesting Relevant Questions Based on a Novel Statistical Rank ”

(Our Ref. No. PS00004657)

May 18, 2020

Contents

1. Search Objective	1
2. Understanding of Subject Matter	1
4. Keywords	3
5. Databases Used.....	3
6. Identified Prior Art Reference(s)	5
7. Summary and Comparison Table.....	9
8. Submission/Observations/Suggestions	10

1. Search Objective

An objective of this assignment is to conduct a patentability search on the disclosed subject matter pertaining to “Software Product For Suggesting Relevant Questions Based on a Novel Statistical Rank ”.

2. Understanding of Subject Matter

The subject matter of present disclosure relates to Search Engines. More specifically, the disclosure relates to a system/method for suggesting contextually appropriate/accurate questions by a search engine query input interface.

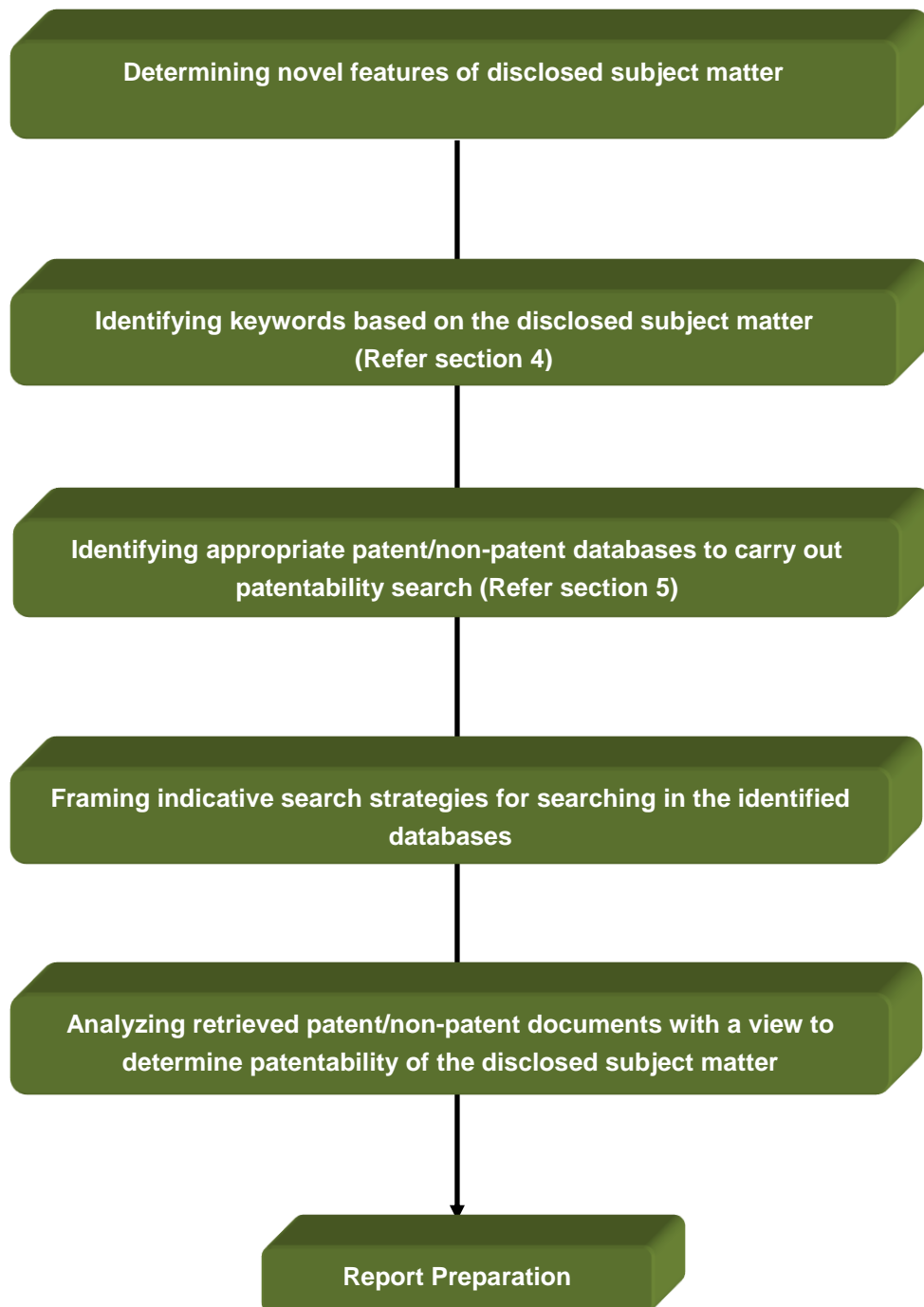
In the learning phase, a learning module is made to learn the best weightage. For this, an excel file with a similarity index is used by the learning module. The excel has an index of a list of potentially similar questions as suggested by each of the Syntactic and Semantic techniques in response to a target question and a corresponding weightage for the questions. The weightage is calculated by “SSRD” i.e. Sum of Squaring Rank Differences 1) Rank assigned by the admin and 2) Rank assigned by the rank suggested by the system. The weightage whose “SSRD” is lowest is chosen as the best weight/candidate. In the usage phase, the system dynamically finds the best weightage and gives appropriate suggestions.

From our analysis of the subject matter and patentability search’s perspective following features are identified as Essential/Key Features:

Feature 1 (F1): A system/method for suggesting contextually appropriate/accurate questions by a search engine query input interface, wherein in the learning phase, a learning module is made to learn the best weightage. For this, an excel file with a similarity index is used by the learning module. The excel has an index of a list of potentially similar questions as suggested by each of the Syntactic and Semantic techniques in response to a target question and a corresponding weightage for the questions. The weightage is calculated by “SSRD” i.e. Sum of Squaring Rank Differences 1) Rank assigned by the admin and 2) Rank assigned by the rank suggested by the system. The weightage whose “SSRD” is lowest is chosen as the best weight/candidate. In the usage phase, the system dynamically finds the best weightage and gives appropriate suggestions.

3. Research Methodology

The following search methodology was adopted for finding relevant prior art documents



4. Keywords

One or more of the keywords listed below have been used in different combinations while conducting the prior art search.

Keywords
COMBINED SYNTACTIC AND SEMANTIC TECHNOLOGIES
WEIGHT VALUE OR WEIGHTAGE
BEST OR HIGHEST SCORE OR APPROPRIATE OR ACCURATE
INDEX OR LIST OR LISTING
NEURAL OR MACHINE W LEARN+ OR ML OR ARTIFICIAL INTELLIGENCE
GENERATION OR PRODUCTION OR YIELD OR OUTPUT OR ACCUMULATE
SMART+ OR DYNAMIC+ OR INTELLIGENT
“SSRD” OR SUM OF SQUARING RANK DIFFERENCES
PREDICT+ OR ANTICIP+ OR FORECAST+ OR ESTIMAT+ OR PREDICT+ OR CALCULAT+
RECOMMEND+ OR SUGGEST+ OR ADVI?E OR PROPOSE OR PROJECT OR PURPORT
SEARCH QUERY OR SEARCH QUESTION OR SEARCH PROPOSAL
IPC/CPC: H02J-003/32 H02J-003/38 H02J-003/38/3 H01L-031/042 H02J-003/00 H02J-2003/007 G06Q-010/04 G06Q-050/06 G01R-011/32 G06Q-020/14 G06Q-050/06

5. Databases Used

Patent Databases

- ☐ QUESTEL ORBIT
- ☐ THOMSON INNOVATION
- ☐ USPTO
- ☐ ESPACENET
- ☐ WIPO
- ☐ JPO
- ☐ GOOGLE PATENTS
- ☐ PATENT LENS
- ☐ SUMOBRAIN
- ☐ FREE PATENT ONLINE
- ☐ DEPATISNET
- ☐ KPO

Non-Patent Database

- ☐ SCIENCE DIRECT
- ☐ GOOGLE SCHOLAR

- ☐ IEEE XPLORE
- ☐ FREEFULL PDF

6. Identified Prior Art Reference(s)

Reference 1

Patent Literature	
Title	Query revision using known highly-ranked queries
Patent Number	US7870147
Filing Date	29-03-2005

Abstract

An information retrieval system includes a query revision architecture providing one or more query revisers, each of which implements a query revision strategy. **A query rank reviser suggests known highly-ranked queries as revisions to a first query by initially assigning a rank to all queries, and identifying a set of known highly-ranked queries (KHRQ).** Queries with a strong probability of being revised to a KHRQ are identified as nearby queries (NQ). Alternative queries that are KHRQs are provided as candidate revisions for a given query. For alternative queries that are NQs, the corresponding known highly-ranked queries are provided as candidate revisions.

[Claim 1]

A method for automatically suggesting known highly-ranked queries in response to a first query, the method comprising:

ranking indexed queries based on a query rank of each indexed query, the query rank calculated based on a frequency of occurrence of the indexed query and a user satisfaction score of the indexed query, the indexed queries including highly-ranked queries that are a predetermined number of queries selected based on the query rank, and nearby queries that are queries that have a statistically significant probability of being revised to one of the highly-ranked queries;

calculating a respective revision score for each indexed query as a function of a revision probability of the first query and the query rank for the indexed query, the revision probability based on at least one of a semantic similarity and syntactic similarity between the first query and the respective indexed query;

selecting one of the indexed queries as an alternative query to the first query based on the revision score;

determining whether the alternative query is one of the highly-ranked queries or whether the alternative query is one of the nearby queries;

if the alternative query is one of the highly-ranked queries, providing the highly-ranked query as a suggested revision for the first query; and

if the alternative query is one of the nearby queries, providing the highly ranked query that the nearby query has a statistically significant probability of being revised to as the suggested revision for the first query,

wherein calculating the revision probability, calculating the revision score, and the selecting are performed by one or more computers.

Reference 2

Patent Literature	
Title	Suggesting and refining user input based on original user input
Patent Number	US8438142
Filing Date	04-05-2005

Abstract

Systems and methods to generate modified/refined user inputs based on the original user input, such as a search query, are disclosed. The method may be implemented for Roman-based and/or non-Roman based language such as Chinese. The method may generally include receiving an original user input and identifying core terms therein, determining potential alternative inputs by replacing core term(s) in the original input with another term according to a similarity matrix and/or substituting a word sequence in the original input with another word sequence according to an expansion/contraction table where one word sequence is a substring of the other, computing likelihood of each potential alternative input, and selecting most likely alternative inputs according to a predetermined criteria, e.g., likelihood of the alternative input being at least that of the original input. A cache containing pre-computed original user inputs and corresponding alternative inputs may be provided.

[Para 0076]

At block 94, the correlation values between pairs of core entities T, T' can be determined using, for example, query logs, web pages and anchor text. The correlation between two core entities T1, and T2, may be defined as a function of a vector of real numbers:

$$\text{Cor}(T1, T2)=f(w1, w2, \dots, wn)$$

where w1, w2, . . . , wn, are the weights of certain predetermined relationships. Examples of the predetermined relationships include (1) synonyms, acronyms and antonyms, (2) compounded phrase such as Shanghai vs. Shanghai City, television vs. television machine, (3) terms in the same syntactic/semantic category, e.g., TOYOTA and HONDA, (4) ambiguous terms and their unambiguous context, (5) names of people and their corresponding activities, e.g., Oprah and talk show host, (6) attributes of terms, e.g., computer and memory, (7) refinement of concepts, e.g., Amazon and Amazon River, Amazon Rain Forrest, and Amazon.com, (8) movie-actors, book-authors, company-product, person-position, etc., e.g., Tom Hanks and Forrest Gump and Bill Gates and CEO.

Other Additional Prior Art

1. US6775666
2. US8086619
3. US8438142

7. Summary and Comparison Table

Comparison of inventive features as present in the subject invention with the teachings of the prior art references

Prior Art References	F1
Reference 1	<p>✓*</p> <p>Abstract</p> <p>Claim 1</p> <p>*Though</p> <p>*Though a method for automatically suggesting highly-ranked queries in response to a query is disclosed, the entire method, particularly “SSRD” based weight calculation is not mentioned.</p>
Reference 2	<p>✓*</p> <p>Abstract</p> <p>Claim 1</p> <p>*Though a method for refining a query is disclosed, the entire method, particularly “SSRD” based weight calculation is not mentioned.</p>

8. Submission/Observations/Suggestions:

Note: To get a Patent, an invention must possess “**Novelty**” as well as “**Inventiveness or Inventive-Step**”. Accordingly, our observations on the potential ‘Novelty’ and ‘Inventiveness’ as present in the proposed invention are as follows:

Insights from the Prior Art Ref: Though prior art references disclose systems/methods for automatically suggesting highly-ranked queries in response to a query is disclosed, the entire method, particularly “SSRD” based weight calculation is not mentioned.

Novelty and Inventiveness

Given the above, if a patent application with independent claims, for example, independent claims, having limitations of feature F1 is filed, it seems unlikely that the claims get objected on the grounds of lack of Novelty/Inventiveness.

-----End of the Report-----

Disclaimer

Khurana and Khurana, Advocates and IP Attorneys (K&K) have prepared this report based on database and information sources that are believed to be reliable. K&K disclaims all warranties as to the accuracy/ completeness/ or adequacy of such information. The patentability search is performed for published patent and non-patent literature for the jurisdictions as covered by the used patent and non-patent databases. The above report is prepared based on keyword/ classification/ and other such information/ which may be extracted from the invention disclosure or otherwise. Neither K&K nor its affiliates/ proprietors/employees (together/ "personnel") are intending to provide legal advice in this matter.